



## Synopsis of *Diplazium* (Polypodiales: Athyriaceae) from Argentina

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### Abstract

The first treatment of the Argentinian representatives of *Diplazium* (Athyriaceae) is presented. In the country, the genus is represented by eight species, all of which inhabit the Yungas and Parana rainforests. Identification keys, comments, illustrations, and ecological remarks for the species are presented. *Diplazium divergens*, *D. moccennianum*, and *D. turgidum* constitute novelties for the Argentinian flora. *Diplazium divergens* occurs in Yungas, and *D. moccennianum* and *D. turgidum* in Parana forest. These species are described and illustrated. *Diplazium divergens* is lectotypified and *D. striatum* is excluded from Argentinian flora.

**Key words:** Ferns, Flora, Polypodiidae, South America

### Resumen

Se presenta el primer tratamiento integral de las especies de *Diplazium* (Athyriaceae) que habitan en el territorio de Argentina. En el país el género está representado por ocho especies, todas ellas crecen en los bosques de Yungas o la selva Paranaense. Se brindan claves para la identificación de las especies, descripciones, comentarios, ilustraciones, y características ecológicas. *Diplazium divergens*, *D. moccennianum* y *D. turgidum* constituyen novedades para la flora argentina, *D. divergens* en las Yungas y *D. moccennianum* y *D. turgidum* en la selva Paranaense. Se lectotipifica a *Diplazium divergens* y *D. striatum* se excluye de la flora argentina.

### Introduction

Athyriaceae is a cosmopolitan lineage of homosporous ferns that comprises three to five genera and nearly 600 species (Rothfels *et al.* 2012; Wang *et al.* 2013). The twinstorus-fern genus *Diplazium* Swartz (1801: 61) is the most species-rich genus of Athyriaceae; it includes nearly 400 species that are widely distributed in wet forests of tropical and subtropical regions, but mainly in Malaysia, where ca. 70% of described species occur. In the neotropics, approximately 150 species occur (Tryon & Tryon, 1982; Tryon & Stolze, 1991; Cislinski, 1996; Pacheco & Moran, 1999; Mickel & Smith, 2004; Mynssen, 2011; Mynssen & Sylvestre, 2009, 2013; Sundue, 2011) and the highest diversity is concentrated in the Andean and Guyanan regional centers (Tryon, 1972).

Previously the neotropical species of *Diplazium* were segregated into the genus *Callipteris* Bory (1804: 282; Pacheco & Moran 1999, Sundue 2011), however, current studies suggest that the segregation of *Callipteris* and other segregates, such as *Allantodia* Brown (1810: 149), renders *Diplazium* s.str. paraphyletic, so they are not recognized as independent genera (Wang, 1997; Wang *et al.* 2004; Rothfels *et al.* 2012; Wei *et al.* 2013; PPG I 2016). *Diplazium* species are predominantly terrestrial, rarely epipetric, and can be distinguished by the following characters: stems usually ascending to erect, rarely long-creeping, bearing scales at the apex; scales usually nonclathrate, brown to blackish-brown, margin entire or toothed; leaves monomorphic, rarely dimorphic; lamina simple to 1–4-pinnate-pinnatifid, glabrous or pubescent; veins generally free (simple or furcated), sori paired “back-to-back” along individual

veins, and each sorus covered by the indusium, which is entire, dentate, lacinate or fimbriate. Sori borne “back-to-back” on both acroscopic and basiscopic sides of a vein were termed diplazioid by early authors, and this has become the trademark of the genus (Kato 1977; Tryon & Tryon 1982; Kramer & Kato 1990; Wang 1997; Wang *et al.* 2004; Rothfels *et al.* 2012; Sundue & Rothfels 2013).

Kramer & Kato (1990), Rojas-Alvarado (2012), and Mynssen & Sylvestre (2013) affirm that knowledge of the species of *Diplazium* is still incomplete, particularly in the neotropics, where the taxa present many nomenclatural and taxonomic issues. For Argentina, no comprehensive treatment of the genus is available; in fact, only a few species have been treated in local floras (de la Sota 1977, Castro 1998, Marquez *et al.* 2006) and information on the Argentinian species is otherwise available only from floristic works of neighbouring countries as Brazil (Mynssen & Sylvestre 2013). Likewise, some taxa from Argentina have been mentioned in two catalogues, three species in Ponce (1996) and six in Ponce *et al.* (2008). New studies on herbarium specimens and recent field work reveal that these last accounts of the genus are also out of date, so the aim of this work is to present the first synopsis of the *Diplazium* in Argentina, including detailed descriptions for the new reported taxa, geographical distribution, and habitat characteristics. An identification key is provided and useful diagnostic characters are illustrated.

## Materials and methods

In this work, an exhaustive bibliographical analysis was carried out and specimens from Argentina, as well as the type specimens, housed at B, BA, BAB, BM, CONC, CTES, HB, JUA, K, L, LE, LIL, LP, LZ, MCNS, MERL, MO, MVFA, NY, P, PR, PRC, R, RB, RCVC, RIO, S, SI and US were consulted (acronyms following Thiers 2016). Additionally, specimens collected by the authors in successive field trips to Corrientes, Córdoba, Entre Ríos, Jujuy, Misiones, Salta and Tucumán provinces, and also the bordering regions of Brazil during 2009–2015 were studied. The collected material is deposited in JUA, LP, RB, RCVC, and SI.

## Taxonomic Treatment

### Key to the species of *Diplazium* in Argentina

- |    |  |                               |
|----|--|-------------------------------|
| 1. | Lamina 1-pinnate to pinnate-pinnatifid.....  | 2                             |
| -  | Lamina 2–3-pinnate.....  | 4                             |
| 2. | Indusia rudimentary or absent.....   | <i>Diplazium lindbergii</i>   |
| -  | Indusia present, persistent.....   | 3                             |
| 3. | Medial pinnae cuneate basiscopically.....  | <i>Diplazium cristatum</i>    |
| -  | Medial pinnae truncate or subcordate basiscopically.....   | <i>Diplazium moccennianum</i> |
| 4. | Stem creeping.....   | <i>Diplazium herbaceum</i>    |
| -  | Stem erect or suberect.....  | 5                             |
| 5. | Indusia with fimbriate margin.....   | <i>Diplazium turgidum</i>     |
| -  | Indusia with margin entire to lobate.....  | 6                             |
| 6. | Sori more than 3 mm long, indusia straight to falcate, flat.....   | <i>Diplazium ambiguum</i>     |
| -  | Sori less than 2 mm long, indusia ellipsoid, and tumid.....  | 7                             |
| 7. | Petioles dark brown to blackish; ultimate segments of the lamina with margin dentate or serrate-dentate..... | <i>Diplazium lilloi</i>       |
| -  | Petiole stramineous; ultimate segments of the lamina with margin entire or subentire.....                    | <i>Diplazium divergens</i>    |

### 1. *Diplazium ambiguum* Raddi (1819: 292)

**Type:**—BRAZIL. Rio de Janeiro: Rio de Janeiro, Mandioca, “in sylvis opacis prope Mandiocca”, *G. Raddi s.n.* (lectotype, designated by Pichi-Sermolli in Pichi-Sermolli & Bizzarri 2005: 212, PI!; isolectotypes FI!; BR). Fig. 1A–B.

**Description and iconography:**—Mynssen (2011).

**Distribution and habitat:**—Venezuela, Colombia, Ecuador, French Guyana, Peru, Brazil, Bolivia, and Argentina. This species has a wide distribution in South America especially in the Brazilian Atlantic coast. In Argentina the species grows in the province of Misiones in dense or open forests, mainly near water courses.

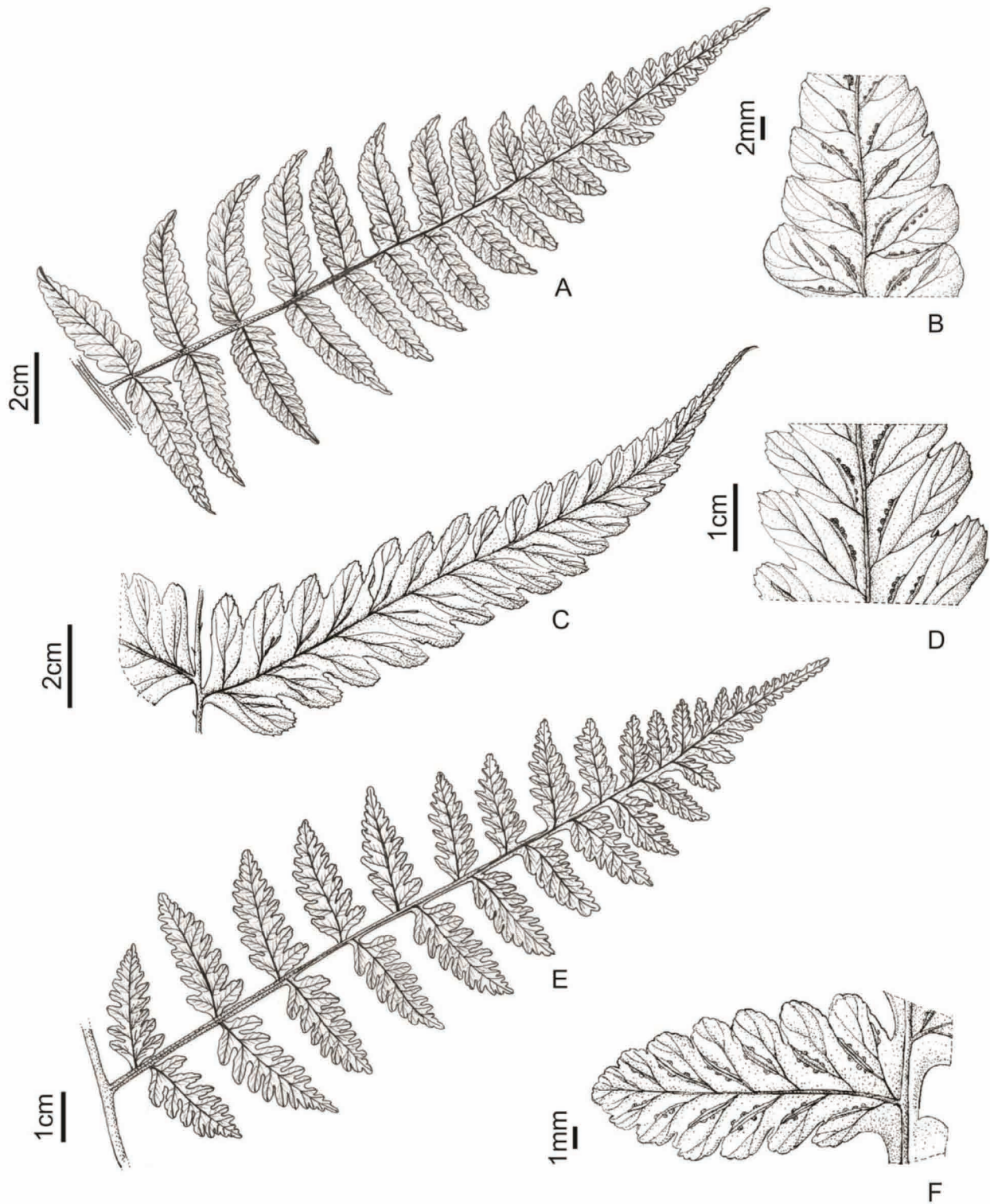


FIGURE 1. *Diplazium ambiguum*. A, medial pinna. B, pinnule with sori. *Diplazium cristatum*. C, medial pinna. D, detail of a pinna with sori. *Diplazium herbaceum*. E, medial pinna. F, detail of last segment of the lamina with sori. A–B, Mynssen *et al.* 1099 (RB); C–D, Mynssen 157 (RB); E, Morrone *et al.* 1422 (SI); F, Brade 8574 (RB).

**Additional specimens examined:**—ARGENTINA. Misiones: Dpto. Iguazú: Arroyo Uruguay-í, a 35 km de Puerto Bemberg, *Capurro* 854 (BA); Dpto. San Pedro. Reserva de la Biósfera Yaboti, Parque Provincial Esmeralda, sendero junto al arroyito de la toma de agua, 22 November 2006, *Belgrano et al.* 589 (SI).

**Notes:**—In *D. ambiguum* the fronds are 2-pinnate and the undersurface of the lamina is glabrous. *Diplazium ambiguum* has very variable leaf morphology, which is not helpful to in characterizing this taxon and a broad study of



many specimens is necessary to delimit segregates. *Diplazium ambiguum* further lives up to its name in the characters of indusia and indument. Margins of the indusia are entire or almost entire. Axes are most commonly glabrous abaxially, but sometimes they are pubescent with spreading, multicellular trichomes. It differs from the similar species *D. expansum* Willdenow (1810: 354) in that that species has lamina minutely pubescent on costae, costulae, veins, and leaf tissue. *Diplazium hians* Kunze ex Klotzsch (1847: 361) from Venezuela is also similar; it differs by the tumid indusia with entire or lobed margin, whereas in *D. ambiguum* the indusia is flat with entire margin.

## 2. *Diplazium cristatum* (Desrousseaux 1797: 94) Alston (1936: 173)

*Meniscium cristatum* Desrousseaux (1797: 94).

Type:—[French Antilla] Martinique, *Martin s.n.* (holotype, P-Lam.!; isotype, B!). Fig. 1C–D.

**Description and iconography:**—de la Sota (1977).

**Distribution and habitat:**—Mexico to Colombia and Venezuela, south to Ecuador, Peru, Bolivia, Brazil, Paraguay, and Argentina in the provinces of Corrientes, Jujuy, Salta, and Misiones. In dense wet or dry forests, often in ravines or along stream banks. *Diplazium cristatum* is the most common species in Argentina. It has been cited as occurring in Chaco province (Hassler, 1928), but we have not found any specimen to corroborate this report.

**Additional specimens examined:**—ARGENTINA. Corrientes. Dpto. Ituzaingó: Predio Santo Domingo, *Keller et al.* 5442 (CTES). Jujuy. Dpto. Ledesma: Calilegua, 30 September 1994, *Ahumada* 7158 (JUA). Misiones. Dpto. Cainguás: Predio UNLP, Valle del Arroyo Cuñá Pirú, 8 January 2003, *Marquez* 30 (LP); Dpto. Candelaria, Loreto, 17 August 1927, *Burkart* 1533 (SI); Dpto. El Dorado: El Dorado, 10 December 1943, *Burkart* 14644 (SI); Dpto. G. M. Belgrano: Salto Andresito 26° 12' S 53° 40' W, selva, 2300 ft., *Morrone et al.* 1371 (SI); Dpto. General San Martín. Pto. Rico, gruta y salto 3 de mayo. 12 December 1970, *de la Sota et al.* 6083 (LP); Depto. Guaraní. Predio de “Moconá Naturaleza y Aventura”, sendero y alrededores del Salto Horacio Foerster, Arroyo Oveja Negra, 27° 8'S 53° 55'W, *Deginani* 1547 (SI); Depto. Iguazú. Puerto Iguazú, 16 September 1910, *Rodríguez* 439 (SI); Dpto. L. N. Alem: Cnia. El Chatón. 24 January 1994, *Guillén et al.* 308 (LP); Depto. Montecarlo. Montecarlo, 24 November 1943, *Porta* 157 (SI); Dpto. San Ignacio. Pastoreo-arroyo Las Tunas, *Schwindt* 5037 (RB); Depto. San Javier: Cnia. Oberá. 25 July 1950, *Schwindt* 4876 (LP, RB). Depto. San Pedro. Parque Provincial Moconá 27° 8'S 53° 53' W, *Guillén* 205 (CTES; SI); Salta. Depto. Orán: Camino de aguas blancas a Baritú, km 17, en borde de Arroyo, 8 December 1986, *Zuloaga et al.* 2608 (SI). Tucumán. Dpto. Chicligasta: estancia Las pavas, *Venturi* 9466 (US).

**Notes:**—*D. cristatum* is one of the most common and widely distributed species in the New World. As pointed by Tryon & Stolze (1991), this is the central species of the complex of species that have the pinnae deeply lobed to pinnatifid; this complex is in need of revision.

## 3. *Diplazium divergens* Rosenstock (1913: 471)

TYPE: BOLIVIA. Yungas, Polo-Polo, near Coroico, *O. Buchtien* 3393. Lectotype (first step designated by Tryon & Stolze [1991: 70]), second step (**designated here!**): GH-00020994!, isolectotypes: P-00642862!, P-00642863!, S-R-1631!, UC-477738!, UC-478343!, US-00810665!). Figs. 3A–B, 4.

Plants terrestrial. Stem erect, scaly, scales extending onto the petiole base. Leaves up to 1.5 m long; petiole 40×0.8–1 cm, stramineous, the base with brown to dark brown, concolorous, lanceolate to lanceolate acuminate scales, margin entire. Lamina to 80 cm broad, 2-pinnate-pinnatifid deltoid to ovate-lanceolate, firm-membranaceous; rachis glabrous, with sparse scales, linear to filiform; pinnae ca. 40×25 cm, contiguous to subdistant, alternate, petiolulate, proximal ones conspicuously petiolate. the costae and costules moderately scaly, the scales orange, filiform to linear and attenuate, margin dentate, glabrous, or rarely the costae with scattered spreading trichomes about 0.4 mm long. Pinnules deeply pinnatisect. Ultimate segments 12–15 pairs, obtuse, free portion twice as long as broad, margin entire or subentire. Veins free, commonly 6–8 pairs on a segment. Sori ellipsoid, most of them 1–1.5(–2) × 0.7–1 mm. Indusia thin, gray-brown, tumid, margin subentire.

**Distribution and habitat:**—Peru, Bolivia, and here cited for the first time to Argentina, in the province of Jujuy, in rainforests of Yungas, 1000–1700 m. This point constitutes the southern limit of the distribution of the species. The first specimen of this species was collected in 1981 and previously erroneously identified as *Diplazium lilloi*, a similar species.

**Additional specimens examined:**—ARGENTINA. Jujuy. Dpto. Ledesma: Parque Nacional Calilegua, Mesada

de las colmenas, 3 November 1981, *Brown & Malmierca 1322* (CTES); idem, camino a Monolito, 24 May 2011, *Ganem, Luna & Arana s.n.* (JUA, LP, RCVC 6772).

**Notes:**—*Diplazium divergens* is very similar to *Diplazium brachycarpum* Mynssen & Sylvestre (2013: 913), a Brazilian endemic species. *D. brachycarpum* has indusia shorter than *D. divergens* and usually fugacious. Regarding the typification of *Diplazium divergens*, Tryon & Stolze (1991) stated that the holotype could be at B and the isotypes are at GH, P and US. However, no specimens of *Diplazium divergens* could be located at B (Zimmer, *pers. comm.*). Among the isotypes mentioned by Tryon & Stolze, we designate the specimen housed at GH (GH00020994!) as the lectotype because it corresponds with all of the characters used to describe the species and because it bears the handwritten annotation “*Diplazium divergens* Ros. n. spec.” by Rosenstock in the label.

#### 4. *Diplazium herbaceum* Fée (1869: 80)

Type:—BRAZIL. Rio de Janeiro, Tijuca, Bico do Papagaio, *A. F. M. Glaziou 2061*, non “2062” (holotype, P-00632631!; isotypes, B\_20\_0047851!, K000632771!, K000632772!, NY01163487! Fragment from herbarium K). Fig. 1E–F.

*Asplenium glaziovii* Baker (1870: 455) *nom. superfl.*, based in the same type of *Diplazium herbaceum*.

**Description and iconography:**—Mynssen (2011).

**Distribution and habitat:**—This species is endemic to southeastern Brazil and northeastern Argentina, in the province of Misiones, where it occurs in swampy places or marshlands.

**Additional specimens examined:**—ARGENTINA. Misiones. Dpto. G. M. Belgrano: 2 km. al sur de Bernardo de Irigoyen, nacimiento del río Pepirí Guazú, 15 October 1996, *Morrone et al. 1422* (SI); Dpto. Guaraní: predio Guaraní, *Tressens et al. 6752* (CTES); Dpto. San Ignacio: Gobernador Roca a Santo Pipó, *Meyer 11710* (LIL); Dpto. San Pedro: Reserva Yabotí, Reserva Provincial Esmeralda, *Marquez & Carrión 143* (LP).

**Notes:**—*Diplazium herbaceum* differs from *Diplazium tamandarei* Rosenstock (1915: 364), a very similar species, endemic of Brazil, by having laminar tissue glabrous between the veins (vs. pubescent laminar issue between the veins) and indusia margin entire to dentate (vs. fimbriate).

#### 5. *Diplazium lilloi* (Hicken 1906: 166) R.M. Tryon & A.F. Tryon (1982: 127)

*Nephrodium lilloi* Hicken (1906: 166). *Athyrium lilloi* (Hicken) Alston (1960: 111).

Type:—ARGENTINA. Tucumán. Dpto. Monteros: La Casita, valle del río Cañasorcona, 1700 m s.m., 26 January 1903, *M. Lillo 2932* (holotype SI 000120!, isotype BM 000937846 digital image!). Fig. 2A–B.

**Description and iconography:**—de la Sota (1977).

**Distribution and habitat:**—Southern Bolivia, Paraguay, and northwestern Argentina, in the provinces of Jujuy, Salta, and Tucumán. It occurs mainly in the mountain regions of the Yungas, in creek banks and shady places from 800 m to 1800 m above sea level.

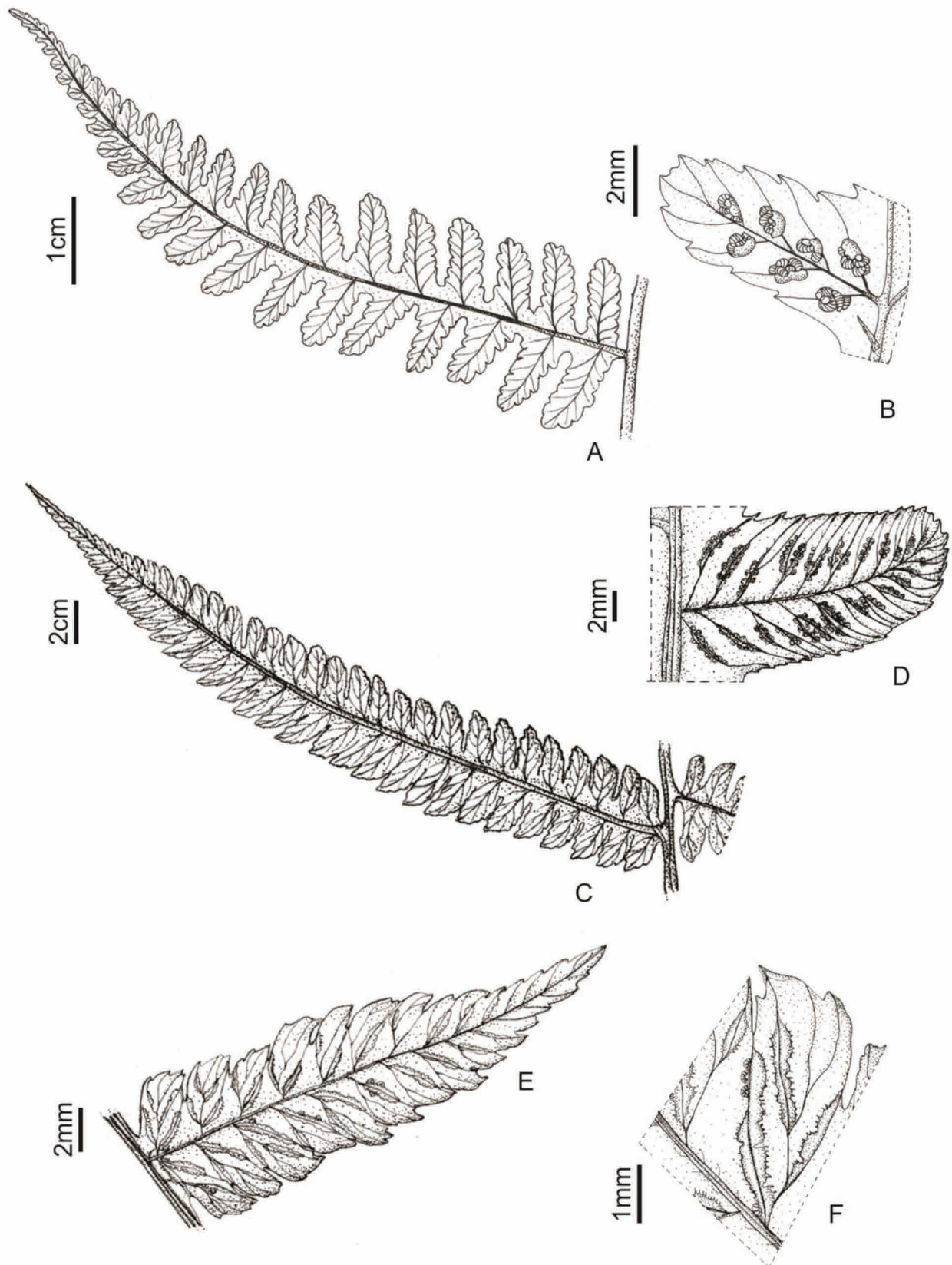
**Additional specimens examined:**—ARGENTINA. Jujuy. Dpto. Capital: el Cucho, Cerro Labrado, *de la Sota 4299* (LP, US). Dpto. Ledesma: en quebrada húmeda, *de la Sota 4436* (LP); Dpto. Ledesma: camino a Valle Grande, 1770m, *Vervoort 8508* (US). Salta. Dpto. Capital: Quebrada Los Berros, *Martínez 872* (MCNS); Dpto. Orán: cerro Astillero, *Pierotti 1361* (US); Tucumán. Dpto. Chicligasta, Las Pavas, *Venturi 3214* (US); Dpto. Famaillá: Villa Nougues, *Venturi 7912* (US). Dpto. Monteros: La casita, *Lillo 7377* (LIL, US); Dpto. Tafí: de Tafí del Valle a Los Nogales, *Meyer 12114* (LIL, US).

**Notes:**— This species is one of the biggest ferns in Yungas of northwestern Argentina. It is characterized by having scandent fronds, up to 1.5m long, with robust petioles of 1 cm diam., that are dark brown to blackish and scaly at the base. These scales are up to 15 mm long, linear-lanceolate, and dark brown to blackish. The lamina is triangular to deltoid, dark green, and bipinnate-pinnatifid to tripinnate-pinnatifid. The ultimate segments are falcate, 15 x 5 mm. The segment bases are adnate and the margins are dentate to serrate-dentate.

#### 6. *Diplazium lindbergii* (Mettenius 1864:36) Christ (1901:27)

*Asplenium lindbergii* Mettenius (1864:36).

Type:—BRAZIL. Caldes, *G. A. Lindberg 543* (lectotype, B\_20\_0048180!, isolectotype K-000632769!, designated by Lellinger 1977: 707). Fig. 2 C–D.



**FIGURE 2.** *Diplazium lilloi*. **A**, medial pinna. **B**, detail of the last segment with sori. *Diplazium lindbergii*. **C**, medial pinna. **D**, detail of the last segment with sori. *Diplazium turgidum*, **E**, pinnule with sori. **F**, detail of the sori showing the indusia. A–B, *Mynssen et al.* 969 (RB); C–D, *Vervoorst* 8508 (US); E–F, *Haerchen s.n.* (R 109507).



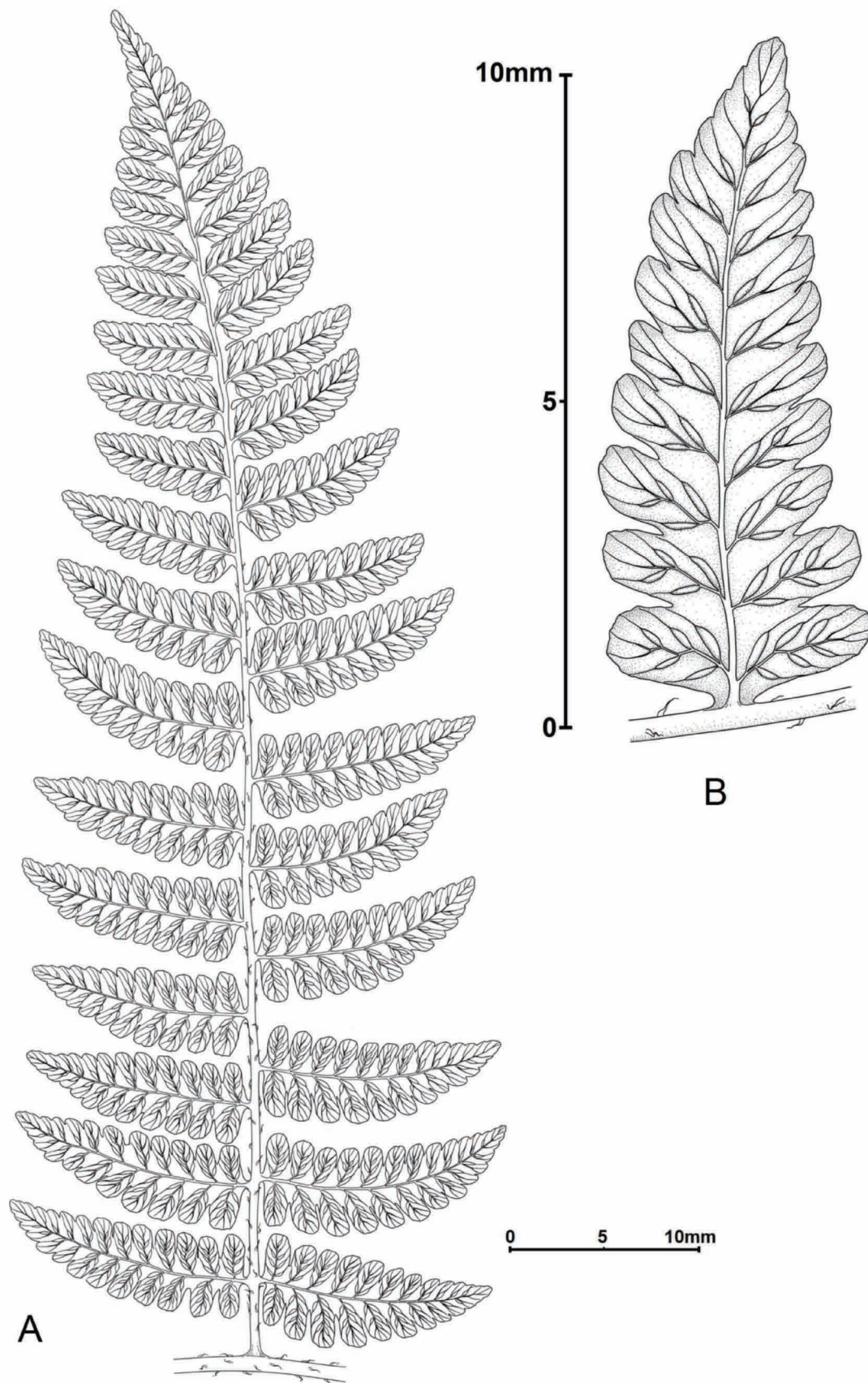


FIGURE 3. *Diplazium divergens*. A, medial pinna. B, detail of the last segment showing the position of sori. Ganem *et al.* s.n. (RCVC 6772).

**Description and iconography:**—Mynssen (2011).

**Distribution and habitat:**—From southern Mexico to Colombia, Venezuela, Ecuador, Peru, Bolivia, Brazil, Uruguay and northeast Argentina, in the province of Misiones, in wet forests along stream banks and slopes of ravines.

**Additional specimens examined:**—ARGENTINA. Misiones. Dpto. General Manuel Belgrano: Salto Andresito, RN 101, *de la Sota et al. 6133* (CTES, LP); *idem, Morrone et al. 1362* (SI).

**Notes:**—In this species, the raised, adaxial edges of the costae are strongly produced, appearing usually as perpendicular, herbaceous wings. Where these are interrupted near the costulae bases, the ends commonly separate from the costa, as short, subacute awns. A similar condition is evident in *D. striatum* (L.) Presl (1836: 114), but the wings of that species are less pronounced and the awns are less conspicuous or lacking.

## 7. *Diplazium moccenianum* (Sodirol) Christensen (1905: 236)

*Asplenium moccenianum* Sodirol (1883: 37).

Type:—ECUADOR: Pichincha, in silv. Pr. Sto. Domingo, 400 m, January 1882, *specim. unicum*, S. J. Sodirol s.n. (holotype P-00220174!). Fig. 5A–B.

Plants terrestrial. Stem erect to 20 cm long, provided at the apex with dark brown to blackish scales, lanceolate, 3–5 × 1.5–2.3 mm. Leaves up to 1.2 m long, 1-pinnate, petiole to 50 cm long, brownish, dark at the base, with a few dark brown scales at the base. Lamina 40–70 × 18–30 cm, firm-herbaceous, gradually reduced to a subattenuate, pinnatifid apex, essentially glabrous and lacking scales. Pinnae 13–21 pairs, 9–19 × 1.9–2.6 cm, lanceolate, pinnatifid, base truncate or subcordate, equilateral or sub equilateral, approximate to subdistant, falcate, attenuate, margins beyond the basal auricle subentire, crenate, or shallowly lobed with lobes usually serrate, or sometimes basal pinnae pinnatifid. Veins free, commonly 1–2-forked. Sori 3–5 mm long, diplazioid or single, borne on almost all veins. Indusia 0.2–0.3 mm broad, thin-textured, brownish, the margins entire.

**Distribution and habitat:**—Ecuador to Peru, Bolivia, and southern Brazil, reported for the first time to Argentina in this work, in the province of Misiones, where it grows in wet forested habitats.

**Specimens examined:**—ARGENTINA. Misiones. Dpto. Iguazú: sendero Jacaratiá, 2 km del CIES, 4 December 1993, *Vanni et al 3253* (CTES).

**Notes:**—*Diplazium moccenianum* (Sodirol) C. Chr. belongs to a complex of very similar species with 1-pinnate leaves, a gradually pinnatifid leaf apex, and pinnae with margins crenate or lobed (Stolze *et al.* 1994). In our studies of South American species of *Diplazium*, we found at least seven species that could be included in this complex: *D. mattogrossense* Sampaio (1916: 18), *D. mutilum* Kunze (1839: 37), *D. blanchetii* Mett. ex Kuhn (1869: 104); *D. ottonis* Klotzsch (1847: 360); *D. mapiriense* Rosenstock (1909: 310); *D. andicola* (Stolze in Tryon & Stolze 1991: 82), and *D. urticifolium* Christ (1901: 29). Further studies are necessary to establish the true morphological limits of each species.

## 8. *Diplazium turgidum* Rosenstock (1907: 109)

Type:—BRAZIL. Rio Grande do Sul. Santa Cruz, Monte Alverne, H.C. Jürgens & A. Stier 148 (holotype ICN!, isotypes HB!, S-R-1644!). Fig. 2E–F.

Plants terrestrial. Stem ascending to erect, this and the petiole base scaly, the scales pale brown, concolorous, lanceolate, the margins entire. Leaves fasciculate, up to 1.5 m long, 2-pinnate-pinnatifid. Petioles 38–150 × 0.6–1 cm, dark brown at the base and brownish with dark spots near the lamina, almost glabrate or with septate trichomes and scales linear with acuminate apex. Lamina chartaceous, 45–150 × 38–77 cm, laminar issue glabrous in both sides, rachis and costae sparsely to moderately pubescent with spreading, articulate trichomes and scales linear. Pinnae 25–62 × 8–28 cm, approximate, or proximal ones subdistant, patent or slightly ascending, stalked. Pinnules 7–12 × 1.5–5 cm, pinnatifid, base truncate, acuminate apex, margin crenate to serrate; costules glabrescent or scattered scales as on the costae. Veins free, simple to furcate. Sori linear to ellipsoid, 2–5 × 0.2–0.4 mm, simple or diplazioid. Indusia thin, light brown, inflated, the margins fimbriate to dentate.

**Distribution and habitat:**—*Diplazium turgidum* Rosenst. was previously thought to be a Brazilian endemic, from the states of Bahia southwards to Rio Grande do Sul, and here is cited for the first time to Argentina (province of Misiones). It occurs mainly in shady, wet places of the forest, near watercourses.

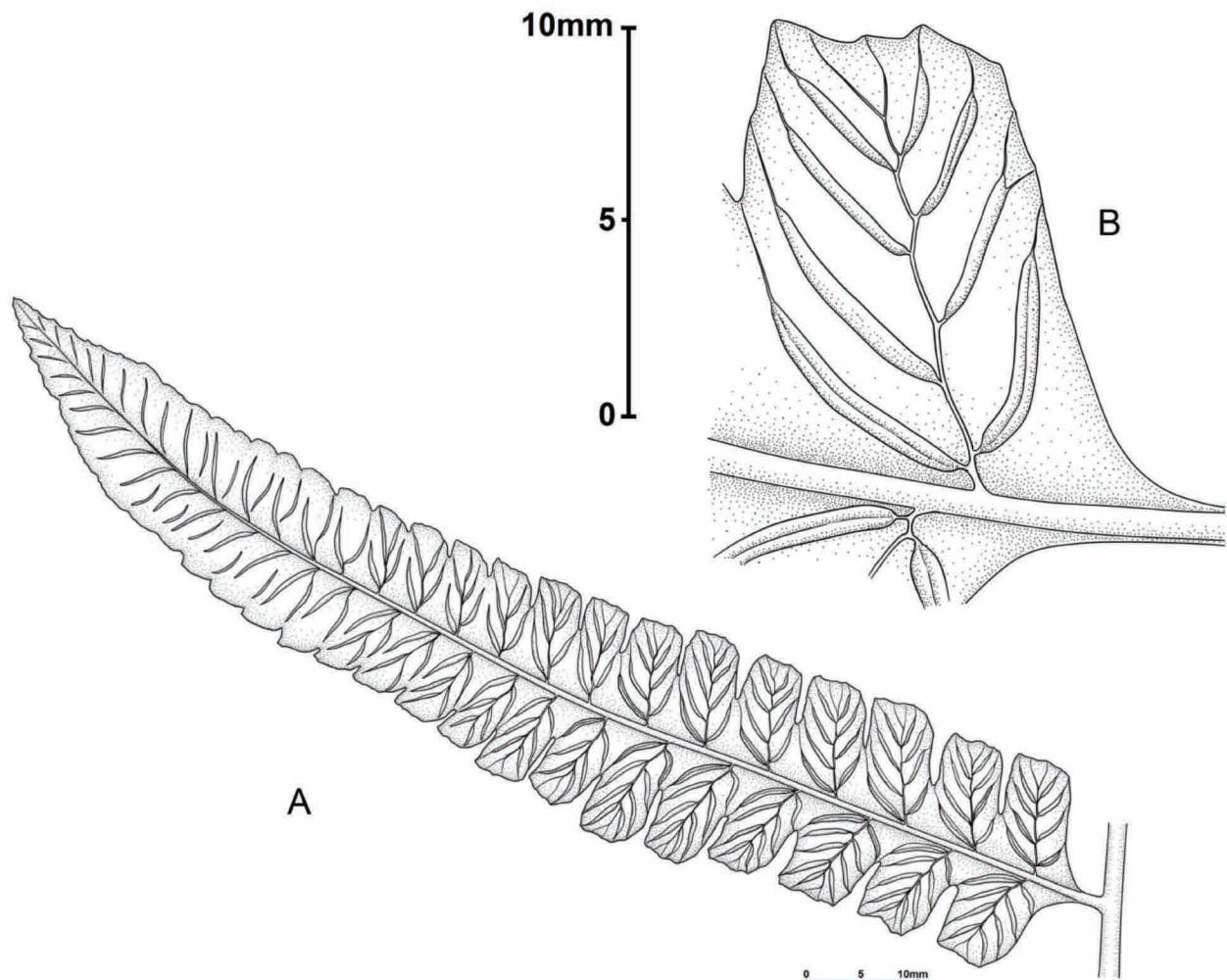




FIGURE 4. *Diplazium divergens*: Lectotype of *Diplazium divergens* Rosenstock (Buchtien 3393, GH 00020994). Reproduced with permission of the Gray Herbarium, Harvard University.

**Specimens examined:**—ARGENTINA. Misiones. Dpto. San Pedro: Reserva de Biosfera Yabotí, Reserva Estricta Esmeralda, Estación Biológica, borde de cascada, 27 September 2004, *Múlgura et al.* 4024 (SI).

**Notes:**—*Diplazium turgidum* is very similar to *Diplazium ambiguum* Raddi, but in the latter species the indusia are flat with margin entire or partially lobed. *Diplazium turgidum* is also similar to *Diplazium hians* Kunze ex Klotzsch (1847: 361), from Mexico, Venezuela, Colombia, Ecuador and Peru, in dissection of the lamina, the shape of the last segments of the lamina and the inflated indusia, but in *Diplazium turgidum* the margin of the indusia is fimbriate, whereas in *D. hians* the margin of the indusia is entire or partially lobate.



**FIGURE 5.** *Diplazium mocceanium*. A, medial pinna. B, detail of the last segment showing the position of sori. *Vanni et al.* 3253 (CTES).

### Excluded species

***Diplazium striatum*** (Linnaeus 1753: 1082) Presl (1836: 114). *Asplenium striatum* Linnaeus (1753: 1082). Type:—“Habitat in America.” “*Filix striata pinnis crenatis, major et minor*” In Petiver (1712: 113, 114, t. 3, f. 3, 4), Lectotype designated by Proctor (1977: 267)

This species was cited from Argentina by Ponce (1996) and Salino & Ponce (2008) based on two specimens. After a search of those specimens, we were able to find one of them (Misiones. Dpto. Guaraní: Predio Guaraní, aprox. 2 Km E de RP 15, Salto Virginia, *Tressens et al* 6851, CTES); this specimen is of *Deparia petersenii* (Kunze 1837: 24) M. Kato (1977: 37), an introduced species that grows in Brazil and Argentina. The second specimen cited from Argentina, *Hassler 571* (Ponce, 1996) supposedly deposited at G, but could not be found in that herbarium, nor the other herbaria

consulted. Given the disjunction between the nearest confirmed record of this species, and the taxonomic difficulties of the species complex which *D. striatum* belong, we suspect that this specimen also represents a species other than *D. striatum*.

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